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The every-spiraling costs of health care is a prevalent issue in the health care arena. Finding ways to curb these costs is an inundating task, especially as expenses and pharmaceutical costs are beginning to climb out of control again. This paper analyzes one institutions response to addressing the current turmoil in health care. In 1993, the university of Virginia Medical Center took an innovated approach to health care with the implementation of a service center organizational structure. This idea was taken from other industries where it has seen success. The philosophy is focusing on the customer, placing needed resources as close to the point of health care delivery as possible.

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Service Center Approach**

**University of Virginia Medical Center
Charlottesville, Virginia**

Capt Neal E. Jennings, USAF, MSC

May 1999

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Abstract

The ever-spiraling costs of health care is a prevalent issue in the health care arena. Finding ways to curb these costs is an inundating task, especially as expenses and pharmaceutical costs are beginning to climb out of control again. This paper analyzes one institutions response to addressing the current turmoil in health care.

In 1993, the University of Virginia Medical Center took an innovated approach to health care with the implementation of a service center organizational structure. This idea was taken from other industries where it has seen success. The philosophy is focusing on the customer, placing needed resources as close to the point of health care delivery as possible.

This paper addresses several issues that resulted from implementing the service center model. First, more detailed cost accounting can be achieved by having all resources needed to provide a service under one umbrella. Second, a benchmarking study showed an ancillary service (Respiratory Care) should use a "virtual centralized" approach to benefit from economies-of-scale while still realizing benefits from a decentralized structure. Lastly, patient satisfaction trends were studied from 1993 to 1998. The result shows that, from a patient's perspective, the health care team's communication and coordination have increased, however staff time spent with the patient has decreased. The latter finding can be attributed to the current "do more with less" health care environment than the service center model approach.

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An Analysis of the University of Virginia Medical Center
Service Center Approach

Introduction

Background

The ever-upward spiraling cost of health care has been a major issue over the last several decades. Currently, health care in the United States amounts to approximately 14 percent of the Gross National Product. From 1932 to 1994, health care costs increased more than 300 fold; greatly higher than what can be explained by inflation over that time frame (Kovner, 1995). The increase is troublesome because it affects all elements of society - industry, government and individuals who have to bear these costs¹.

Williams and Torrens (1993) attribute this phenomenal rise to four major factors:

- The Hill-Burton program;
- The increase in the number of physicians;
- The growth in medical science and technology; and
- The proliferation of health care insurance.

The first factor was brought about in 1947 when Congress established the Hill-Burton Act, a federal program to generate growth in the number of hospitals throughout the United States. Here, government subsidies provided incentives for the building and expansion of hospitals. This initiative led to substantial hospital growth and in turn increased the number of beds. The increase of beds then led to a greater number of admissions

(i.e., if beds are available physicians will fill them).

The second factor was an initiative to increase the number of physicians throughout the United States. The purpose was to increase access to health care, especially in rural areas. This was accomplished by increasing the number of, or expanding existing medical schools. This approach worked well, generating more physicians per capita. With more physicians per capita, they were able to provide more services, which, ironically drove up health care costs. This is counterintuitive to the traditional laws of economics, where more supply typically means lower costs.

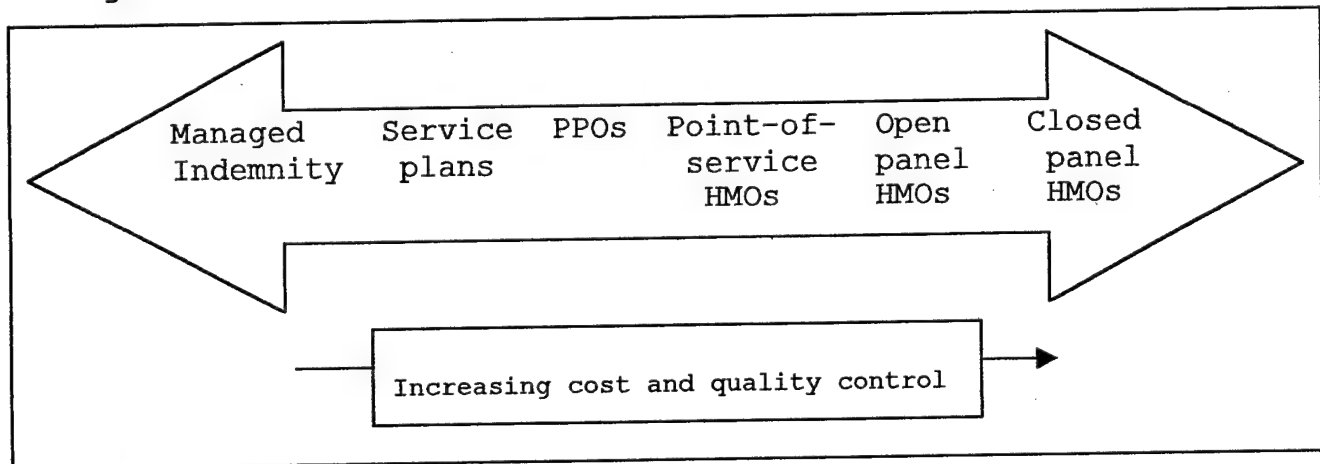
The third factor is the dramatic advancements in medical science and technology. The exponential growth here was stimulated through the use of donations and grants provided by public, government and private entities. The main thrust was to improve the quality of health care. For example, finding alternative ways to treat patients that are less invasive, thereby reducing the risk to the patient (i.e., heart disease medicines, magnetic resonance imaging, etc.). However, the increase in quality also came with an increase in cost.

The fourth factor is the effect that insurance, whether private or public, has had on increased demand for health care². With insurance paying the majority of health care costs, consumers did not have incentive to curb their demand, question costs, or seek less expensive options. In 1965, the government added substantially to this demand with the introduction of Medicare and Medicaid. However, over the last several years, the

government and insurers (to include self-insured employers) have taken several steps to reduce the rise in health care expenditures.

Although the rise in health care costs are in some way understandable, the increased emphasis on reducing this rising cost has generated a push to manage the delivery of health care. After approximately 10 years of ad hoc initiatives and limited legislative activity³, "Managed Care" burst onto the scene as the response to the ever-increasing health care costs. Kongstvedt (1996) states that managed care is "The active management of both the delivery system through which care is provided and the medical care that is actually delivered to individual patients." He goes on to describe the concept regarding managed care as a continuum, which can be seen in figure 1.

Figure 1: Continuum of Managed Care



Source: (Kongstvedt, 1996)

However, results are now indicating that managed care has only temporarily curbed the escalating costs. In fact, the improvement is thought to be a transitory affect resulting from people enrolling in managed care plans. Once the transition stabilizes, some predict that health care will continue at its previous, rapid pace. A new report from the Department of Health and Human Services states that managed care measures have peaked and that health care spending may double from \$1 trillion to \$2.1 trillion by the year 2007 (Stern, 1999). It is apparent that additional measures must be taken if the United States is to gain control of health care expenditures.

Barlett (1997) recommends that health care organizations look to other industries for best practices, and adapt strategies that can improve the delivery of health care. She also states that organizations should think benefits, not features, as well as integrate morbidity and mortality with product management. The issue here is that the customer is concerned with the end result, not the method of achieving it. "...Companies developing best practices always seek ways to make improvements in their products and services as well as enhance their relationships with suppliers and customers." (Hiebeler, Kelly, Kettelman, 1998) With properly implemented controls, health care organizations can ensure they are providing health care that meets customers expectations while minimizing costs.

Pence (1997) states that for hospitals to compete in today's market place, with reduction in reimbursement rates and the growing emphasis on quality and patient satisfaction, they

must find new and innovative ways to deliver health care. Similarly, Patronis-Jones, Dougherty, and Martin (1997) state "To compete, and possibly survive, hospitals and caregivers are attempting to restructure work environments to provide high-quality patient care combined with the right blend of customer service while still keeping costs low."

Additionally, as the media and the health care industry continue to disseminate information regarding health care, consumers of this market will become more educated and demand higher quality services at a reasonable cost. "As health care executives and their boards begin to rethink traditionally held assumptions about hospitals, we will see totally revised systems that are re-designed to truly respond to a much more sophisticated, scrutinizing, and cost conscious customer." (Mueller, Marinari, Kunkel, 1995). Barlett, (1997) states "...health care historically has been practitioner active and patient passive..." and "As the baby boomer generation begins to worry about osteoporosis and chest pain, it will become sophisticated, demanding, and well informed."

Currently, one measure gaining popularity in meeting these challenges is the service center model. Similar concepts are "product-line"⁴ and "focused factories"⁵. These practices have been successful in other industries by enhancing customer satisfaction, quality and reducing costs. The methodology enables a company to better control its processes, and thus, optimize its products or services. The main thrust is delivering services that focus on the customer. The strategy places the

needed resources as close to the point of service as possible. The concept is thought to enhance operational efficiencies and thereby reduce costs while raising customer satisfaction; a win-win in the market place. This ultimately will heighten an organization's competitiveness, thereby strengthening their chance of survivability.

Several health care organizations who have implemented this model are Jackson Memorial Medical Center (Miami, Florida), Intermountain Health Care (Salt Lake City, Utah), and the University of Virginia Medical Center. They believe this method will address the issues health care organizations are currently undergoing and will face in the future. Their philosophy is that areas responsible for providing the service should also be empowered to improve the process as they deem necessary. By implementing this concept, stovepipes are eliminated and issues can be resolved in a diversified-team approach.

Conditions Which Prompted the Study

In 1993, the University of Virginia Medical Center (UVaMC) implemented the "service center" model, which at the time was an innovative approach toward health care delivery. UVaMC's purpose for implementing this approach was to provide health care that focused on the patient rather than functions or physicians. The goal was to provide high quality care that resulted in high patient satisfaction. UVaMC believed that the service center model would meet this objective by structuring health care delivery based on the continuum of care, and aggregating the administration of similar services.

The UVaMC environment provides an excellent opportunity to study how well this approach serves the health care industry. Now in place at UVaMC for over five years, the service center model's charter of providing high quality care is evident from the levels of patient satisfaction and quality indicator results. UVaMC was recently named by HCIA as one of the nations top 100 hospitals⁶.

However, up until now, cost and resource accounting have not been as much a focus as quality and patient satisfaction indicators. With decreasing government funding and third-party payer reimbursements, cost accounting is now a critical issue to the survival of UVaMC and other health care organizations.

Statement of the Issues

As noted earlier, the service center approach has been proven effective in other industries. However, it is a new concept for health care organizations. As such, issues of how to best adapt this model to the health care environment are still being addressed. Issues such as quality and patient satisfaction indicators, benchmarking, and financial models are works in progress. Finding the right complement will take time, but these elements will have to remain flexible as the health care market changes constantly.

Additionally, the service center concept is based on the principle of decentralization. This was thought to give each area's administration more control of its services. However, now implemented, problems directly related to this type of management structure are coming to light. The decentralized

services find it is difficult to augment resources during peak workloads and when personnel take leave or unscheduled absences. The issue here is what is the best management structure for the service center model; decentralization or a balance between decentralization and centralization?

Literature Review

There are numerous articles that discuss the concept of the service center methodology. Although some articles address the concept by a different name, the main thrust is to focus on the patient while maximizing efficiency and effectiveness in the delivery of health care. Other names referenced by articles are patient-focused care, patient-centered care, "hospitals within hospitals", product-line method, and service centers. These concepts will be discussed throughout the literature review.

The New Paradigm

Intermountain Health Care's management philosophy reflects the service center approach by focusing on the customer: "...We need to meet or exceed our customer's expectation 100% of the time. If we are successful, we will develop a relationship with our customers that builds trust and confidence in us as their health care provider, ultimately allowing us to maintain market share." (Frommater, Marshall, Halford, Rimmasch, Coons, 1995) Again, the most important aspect of the service center approach is providing care that focuses on the patient's needs. One new concept for health care is being discussed by Regina Herzlinger in her new book called "Market Driven Health Care". In it she discusses the term "focused factories", where a

diversified team is focused on delivery of one specific type of service (e.g., hernia repair). The goal here is to become a "center of excellence". Carnegie states: "And here is the prime condition of success, the great secret: concentrate your energy, thought, and capital exclusively upon the business in which you are engaged. Having begun in one line, resolve to fight it out on that line, to lead in it; adopt every improvement, have the best machinery, and know the most about it."

These concepts are derived from a similar idea that has been used in several other industries for a couple of decades now⁷. "The business industry has been decentralizing and restructuring companies for years to improve worker productivity, decrease costs, and enhance customer satisfaction." (Patronis-Jones, et al., 1997) Additionally, "The patient-focused care concept first appeared in literature in the late 1980's. Eight to ten years later, there is still no one accepted definition or clearly explicated model for this care philosophy." (Johnston and Cooper, 1997) One example of an adaptation strategy is shown in table 1, which was implemented at Jackson Memorial Medical Center.

Even though there is no single definition for this new management approach, initial experience indicates that it has considerable advantages over the traditional model. With the service center approach, resources are placed as close to as possible to the point of service delivery. This enhances communication and coordination, and ultimately the delivery of

health care.

In the past, with a departmental approach, there was no one point of control for the process. As such, there was little incentive to improve the process as a whole. The services provided to the patient crossed several departmental boundaries with each department focusing on their specific tasks. Communication and coordination across these boundaries left a lot to be desired.

Table 1: Changing Corporate Culture (Jackson Memorial Medical Center)

Current state	Future state
Reactive	Proactive
Management	Leadership
Crisis management-oriented	Shared vision
Problem-oriented	Solution-oriented
Minimal focus on customer	Customer friendly/oriented
Policy- and procedure-driven	Flexible policies and procedures
Decision making pushed to top executives	Quick to make decisions at lower levels
Territoriality	Teamwork
Minimal risk-taking	Risk-taking
Resistant to change	Open to new ideas
Political	Open, honest communication
Conflict avoidance	Conflict-tolerant
Apathy	Energetic

Source: Beerman, et al. (1998)

However, the departmental paradigm is quickly changing with the increasing pressures of competition in the health care market. "It is becoming increasingly evident that traditionally organized, functionally structured health care institutions will no longer be able to deliver valuable services to their customers." (Duffy and Lemieux, 1995) The new organization structure must be able to respond quickly to changes in the health care environment. "The new vision and mission will demand new flexible, rapidly responsive, and well-integrated systems; redefined roles; transformed work and paradigm shifts in providers; redefined information management systems; and significantly different approaches to resource allocations, especially capital." (Mueller, et al, 1995) The organizations who can rapidly adapt to this new philosophy will be able to survive, and even prosper in the new age of health care.

Regardless of the approach taken, the focus in the new era of health care is the same; to provide patient-centered health care that produces high quality, patient satisfaction, and is cost effective. The model developed at a community hospital located in Thomasville, North Carolina was designed with three goals in mind:

1. Improve patient satisfaction through more timely, responsive and less personnel contacts;
2. Streamline systems and reduce overall inefficiencies; and
3. Reduce expenses through a reduction in personnel and/or reduction in skill mix requirements. (Rouch and Stafford, 1996).

Kimble (1997) lists the most common goals identified by several hospitals for the patient-focused process:

1. Grouping patients by common characteristics;
2. Decentralization of services;
3. Cross-training and multi-skilling;
4. Streamlining process and reporting structures;
5. Empowerment of staff.

Goals established by Intermountain Health Care are listed in table 2 and their implementation model can be seen in figure 2.

The organizational structure required to implement a process that will meet the above goals requires substantial change from the traditional structure. "We needed to simplify processes, open lines of communication, and begin to focus on the customer." (Beerman, Bensell, Breeden, Denker, Gallego, Harvin, Kontz, Krueger-Jones, Martin, Mass, Oza, Perdue, Rogers, Sears, Williams-Welch, 1998) This will be a major step to tearing down the barriers typically associated with a departmental organization. The re-organization must incorporate re-engineering throughout the entire organization. Patronis-Jones (1997) states that "The theme of patient-focused care is operational restructuring involving the physical plant, job descriptions, and processes to organize more efficiently and effectively the delivery of health care that is centered on the patient." The restructuring is designed to provide a more streamlined approach to delivering health care to the patient. "Patient-focused care combines all the elements of re-design, re-engineering, and restructuring. It places the patient at the center of the delivery of care and redirects activities so that

the right job is performed effectively by the right person at the right time." (Pence, 1997)

In converting to a patient centered environment, the patient's requirements must be kept at the forefront of the re-design process. To determine where to begin this process, Mancini (1995) states that, "Making changes to establish a supportive, healing environment must start by identifying what the patient needs and wants, rather than how the hospital has always functioned."

Table 2: Planning Session: Prioritization of Heart Services' Goals
(Intermountain Health Care)

1. Develop an operational system that supports a smooth flow of patients through the continuum of care.
2. Maintain state-of-the-art clinical services through research and development.
3. Develop a comprehensive marketing plan for in-state and out-of-state markets.
4. Increase education of patients and staff.
5. Appropriately address new reimbursement methods.
6. Develop a unified process to assess quality.
7. Develop a comprehensive referral network.
8. Develop a multidisciplinary resource plan (facility/equipment/people).
9. Communicate position excellence.

Source: (Frommater, et al. 1995)

Figure 2: Heart Service Line Structure (Intermountain Health Care)

Source: (Frommater, et al. 1995)

Cardiovascular Medical Staff Work Group

Chief, Surgery (CT Surgeon)
 Chief, Cardiology
 Chief, Thoracic Surgery
 Chief, CV Anesthesia
 Chief, Pulmonary Medicine
 Director, CV Lab (Cottonwood)
 Director, CV Lab (LDSH)
 Director, ICU (Cottonwood)
 Director, Mechanical Circulation Support
 SLV Administration
 Director, IHC Heart Services
 SLV Cardiology
 SLV Nursing
 SLV Case Management
 SLV Operating Room
 SLV Quality Resources
 IHC Health Plans



Members

Cardiac Executive Council
 Administration
 Division of Cardiology
 Division of Thoracic Surgery
 Division of Critical Care Medicine
 Department of Anesthesia
 Nursing
 Case Management
 Operating Room
 Corporate Office
 Organization's Insurance Plans
 Quality Resources

Time-Limited Work Teams
 SLV Frontline Nursing Staff CCU, TICU, Acute Care Units
 SLV Respiratory Care
 SLV Case Management
 SLV Social Services
 SLV Pharmacy
 SLV Operating Room
 SLV Diet Services
 SLV Cardiac Rehabilitation
 SLV Quality Resources

Division of Cardiology
 Public Relations
 Planning and Marketing
 Patient Relations
 Cardiac Rehabilitation
 Quality Resources

Division of Cardiology
 Quality Resources:
 Research Analyst
 Quality Consultant
 Planning and Marketing
 DRG Coordinator
 Finance
 Patient Account Services
 Health Information Services

Functions

Cardiac Executive Council

- Identify major goals for the Heart Service Line
- Identify key processes
- Set priorities for the Heart Service Line
- Direct work teams
- Make data-driven process changes to improve quality and decrease cost

Clinical Process and Outcome Team

- Coordinate all clinical projects
- Analyze clinical processes
- Initiate and oversee time-limited work teams
- Facilitate communications between work teams
- Implement changes in care processes
- Evaluate impact of process changes

Satisfaction Team

- Assess expectations of customers
- Measure perceptions of quality and service
- Analyze and communicate results
- Develop internal/external communication plan for the Heart Service Line
- Develop marketing strategies for Service Line
- Program evaluation

Resource Team

- Information Central for Heart Service Line
- Support data needs for all Service Line Teams
- Report key Service Line data
- Assist in business plan development
- Provide market/environmental assessments
- Assist in packaged Heart Services planning

Clinical Process/Outcome Team

Teams
 Extubation
 Activity
 Pain
 Nutrition
 Social-emotional
 Pharmacy
 Operating Room

PTCA Team

Open Heart Team

Multidisciplinary Communication Team

Satisfaction Team

Resource Team

Customer Satisfaction Team

Communications Team

Marketing Team

Database Team

Analysis Team

Financial Team

Patient Satisfaction and Quality Indicators

As this methodology is based on centering care around the patient, patient satisfaction and quality indicators will be the drivers in meeting the objectives. However, it is important to understand the meaning of the indicators from the patient's perspective. For example, in Mancini's 1995 article, she mentions that the number one patient satisfier is the quality of nursing care. Yet, Mancini goes on to ask the question "What does 'nursing' mean to the patient? Does it mean care provided by a registered nurse, or does it mean care given by anyone who helps keep the patients warm, dry, and pain free? Do patients even know who their registered nurses are and what they do?" Whatever the indicators, the results of these metrics must be a catalyst for continually improving quality through fine-tuning the system for optimal health care delivery.

As such, the patient satisfaction and quality indicators should be designed to guide the organization in meeting the patient-centered goals. Here, it is important that the metrics incorporate flexibility. Lanza, Binus, McMillan (1997) state that "Indicators focus on both improvement in patient performance and organizational performance. They are interdisciplinary in nature and outline data gathering and reporting schedules and responsibilities." These metrics will be works in progress, constantly changing as process improvements are made. "...we must continue learning and adapting to meet current needs." (Frommater, et al., 1995) Lanza, and his colleagues also recommend that a log be kept for each

quality metric to record strength and weaknesses. This information can be used to make the necessary fine-tuning during periodical review of the measures. Table 3 lists a sample of patient satisfaction questions asked by Jackson Memorial Medical Center.

Additionally, communication of metric results is essential to provide the necessary feedback to make needed changes. The dissemination of information must be throughout the organization. Rouch and Stafford (1996) state that the results must be communicated to both "internal and external constituents". Furthermore, Niles, Tarbox, Schults, Swartz, Wolf, Robb, Plume, Nelson and Nugent (1996), emphasize that it is important to understand the service from the perspective of the patient. They did this by flowcharting the process (see figure 3). Furthermore, they broke down the key quality indicators into six categories:

1. Comfort;
2. Convenience;
3. Caring;
4. Communication;
5. Certainty; and
6. Cost (to the patient).

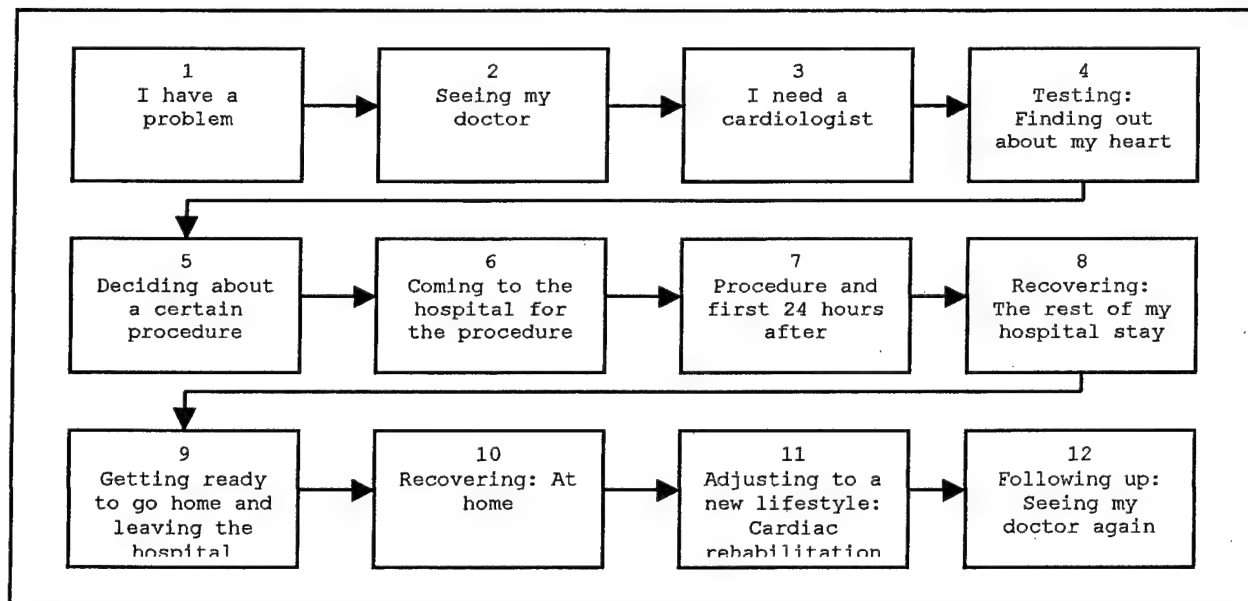
Although it is the patient satisfaction and quality of services that will be driving the patient-centered methodology, it is important to monitor other aspects as well. Several articles point out the importance of monitoring the family, staff, and physician satisfaction (Patronis-Jones, et al., 1997, Reisdorfer, 1996, and Kirkhart, 1995). After all, if these areas are not doing well, it is improbable that patient satisfaction and perceived quality will be high. At Mercy San

Juan Hospital in Carmichael, California, Kirkhart (1995) states that surveys were taken on a bimonthly basis of physicians, nursing staff, student nurses, patients, and family for use in determining satisfaction trends.

Table 3: Patient Satisfaction Survey (Jackson Memorial)

1. If you had to do it again, would JMH be your choice for prenatal care and delivery? If not, why?
2. Were the services received provided in a timely manner?
3. What creates the most frustration for you as our patient?
4. How can we help you most during your visit here?
5. What do you like most/least about us and the services we provide
6. What can we do to make your visit less stressful?
7. Was the staff courteous/caring to you?
8. If you could make one significant change to improve our services, what would it be?
9. After your delivery, do you plan to continue to use JMH for health care services for yourself and your child? If no, why not?

Source: Beerman, et al. (1998)

Figure 3: Patient Experiences Flowchart

Source: Niles, et al (1996)

Operational Efficiencies

As mentioned above, , it is important to deliver high quality health care that satisfies the patient. However, for the institution to survive it is also essential that this care be provided in a cost effective manner. Therefore, it is essential to monitor operational efficiencies, especially in this era of decreasing budgets and reimbursements. Common metrics used have been length of stay, cost per patient per day, hours per patient per day, paid hours per adjusted discharges and full time equivalents (Patronis-Jones, et al., 1997, Kirkhart, 1995). "The challenge is relating costs appropriately with the specific services provided." (Goodman, Campbell, Millar, Cook, Jennings, Rimmer, Evans, 1998). In other words, it is becoming important to associate costs to the service that generates them so that when cuts have to be made, organizations

can distinguish between the more efficient from the least efficient services. With decreasing reimbursement rates, this will be the "make or break" of many organizations.

One aspect commonly looked at to enhance operational efficiencies was the cross-training of personnel. By cross-training personnel, individuals are capable of doing several tasks making for a more flexible work force. Flexibility is extremely important with the decentralized approach. In the centralized approach, staffing can be moved from area to area to meet inevitable situations such as vacations, sick leave, or increased workload. The decentralized approach design is not as flexible and thus does not accommodate these instances as readily.

Pence states that "Unanticipated activities and tasks make staffing decisions [difficult]. Staffing plans must be flexible to respond to changes in the numbers and acuity of the patients." He notes that a cross-training approach can meet this requirement. However, UVaMC's Jim McGowan⁸ stresses that it is important to consider the "...issue of state licensure laws and limits placed on, or what work can be delegated to, those cross-trained." For example, what additional roles can LPNs take on that were previously the responsibility of the RN, and still adhere to state licensing regulations.

When an organization implements cross-training, it in turn must re-design the staff roles to reflect these new responsibilities. The new roles in the patient-centered system varied somewhat across the facilities that implemented cross-

training. Although there were variations in the implementation, each of these facility's goal was to institute a more flexible team with the ability to handle the day to day tasks of the unit in the most efficient manner possible.

At San Juan Hospital, the staff went from an all RN nursing staff to a combination of RNs, LVNs and NAs. In addition, there was a pharmacy and respiratory therapist located on the unit. The pharmacy ensures that the patients are receiving the correct medication by staffing a pharmacist there during peak hours. The respiratory therapist does tasks previously performed by the nursing staff. (Kirkhart, 1995)

At Albert Einstein Medical Center, six new job roles were developed and implemented for a unit. They were physical therapist, registered nurse, licensed caregiver, non-licensed technician, support associate, and administrative associate. Although some of these positions were in existence with the former structure, the roles of these positions changed to allow the staff more flexibility. For instance, the licensed caregiver was trained to provide basic respiratory interventions and the non-licensed technician performed tasks such as phlebotomy, eletrocardiography, assisting physical therapy, vital signs measurements and bed making. (Patronis-Jones, et al., 1997)

The Sioux Valley Hospital created new roles for director, clinical care coordinator, primary nurse, associate nurse, patient care technician (PCT), health unit coordinator (HUC), and patient support representative (PSR). Here, the nursing

duties were divided into three separate tiers, based on experience, competence, and preference. The PCT assists the RNs by performing basic patient care as well as phlebotomy and oxygen therapy. The PSR performs housekeeping, stocking supplies, patient care and transport duties. The HUC handles non-clinical patient care aspects such as coordinating financial counseling, record-keeping and reception tasks. (Reisdorfer, 1996)

Although the role names vary from organization to organization, the basic duties for the roles are similar in nature. The cross-training approach provides the necessary resources to give comprehensive patient care that is dedicated to the unit and falls under the unit director's control. Furthermore, since some duties overlap, the roles of multi-skilled personnel are flexible. This allows the unit to handle occurrences of increased patient activities or filling in for personnel who are sick or on vacation without having to seek external assistance.

There have been both negative and positive consequences in implementing the new roles in support of the patient-centered approach. Kimble (1997) highlights several of these in his article discussing the structural change from the perspective of respiratory care practitioners (RCP). The 4 main negatives he finds are:

1. Elimination of the department and support staff;
2. Removal of the RCP from key areas of the hospital, such as intensive care and the emergency room;

3. Elimination of respiratory care management staff and shifting of responsibility to another department, usually nursing; and
4. Shifting of the focus of the RCPs work from clinical to supportive (nursing assistant, patient support, or housekeeping duties).

The positives that Kimble discusses are centered around increased job responsibilities. He lists 4 favorable outcomes with the patient center-approach:

1. Some institutions have added pulmonary function assessment, noninvasive and invasive cardiology, phlebotomy, electroencephalography, polysomnography, hyperbaric oxygen therapy, and bronchoscopy to the RCPs responsibilities;
2. Through the development of patient care protocols, algorithms, and critical pathways, RCPs assess, implement, and modify care without direct physician involvement;
3. RCPs have served on planning and implementation teams for the patient-focused model; and
4. Respiratory care managers have been granted additional duties such as overseeing biomedical engineering, infection control, and electrocardiology.

It is important to match the new roles of the health care professionals (HCP) with their skills in a way that can best be utilized in the organization. An important consideration is not to inundate any one specialty with more responsibilities than can be appropriately handled. Input from the HCPs will be the best resource for this determination. Additionally, adequate training must be provided for a smooth and successful transition to the new roles. This will minimize disruptions and incidents in the daily delivery of health care.

Purpose

The purpose of this study is to examine the service center model at UVaMC, researching and studying methods for establishing appropriate indicators and models that are needed to optimize the service center concept. Issues such as quality and patient satisfaction indicators, benchmarking, and financial models will be addressed. In addition, methods to address problems relating to decentralization will be studied, to include an analysis of possible centralization of certain resources. Three specific areas will be looked at in this study.

The first area of study will focus on detailed financial accounting of a service center to assess if it will more accurately determine its value to the organization. The issue here is allocating true costs and resources to the services that use them rather than an across-the-board allocation. This theory will be tested by developing a financial model that allocates costs to the services in Surgery. This model will include capital depreciation, operating expenses, and operating room time as inputs.

The second area will focus on the issue that certain positions and resources that are currently decentralized may be more efficient if they were centralized. For example, certain services only need one type of discipline (i.e., Respiratory Care, Physical Therapy, etc), however when the individual filling that role is sick or takes a vacation it is difficult to augment the position. Furthermore, ways of benchmarking will be looked at, comparing UVaMC's operational efficiencies with other

similar institutions.

The third area will look at metric indicators and compare them over a five year period. Observations will be made to determine if the indicators are improving, staying the same, or declining.

Method and Procedures

Research Methodology

The study will use both qualitative and quantitative data to assess the effectiveness and efficiencies of operations. The qualitative data will be from perceptions and opinions of the people who work at or use the UVa Health System. The portion of the study using quantitative data will look at management indicators such as patient satisfaction and quality, and use this data to compare with prior years.

The goal will be to gather information on the current functions and processes, how it has evolved, and where it is expected to go in the future. Types of information will include costs associated with services provided, patient satisfaction levels, and operating efficiencies. This information will be compared with past data and with data from other similar organizations. The purpose will be to identify the strengths and weaknesses of the service center methodology.

It is important to note that the analysis must distinguish between results that were influenced by the service center model as opposed to other factors. For example, were improvements in efficiencies a result of the implementation of the service center model or a change in hiring practices (e.g., soliciting

staff with more skills, change in leadership, etc.), or a combination of both? The analysis will have to address the various possibilities.

Data Collection

The data in this study shall be collected from both primary and secondary sources. The primary data will be collected from historical, financial, and metrics used at UVaMC. Additionally, opinions and perceptions from the staff at UVaMC will be collected. Secondary data will be collected from literature reviews and organizations such as the University HealthSystem Consortium information.

Additionally, observation of operations will be used to assess efficiency and effectiveness of the processes throughout the Surgical Services. This will be accomplished through the use of reports, interviews, and from the experience of staff.

Furthermore, during the monitoring process, interviews will be conducted with the administrator, managers and various employees throughout the Surgical Services. The purpose of these interviews will be to gain an assessment of how the service center model functions based on opinions and perceptions of the personnel who work in the area on a day-to-day basis. Questions will be along the lines of:

- How the process worked approximately five years ago;
- How it has evolved;
- Lessons learned; and
- What changes will be needed in the future.

It is critical to an accurate study that validity and

reliability issues are observed closely. This will be accomplished by ensuring that data is collected in a consistent format, which will minimize the possibility of errors or bias. In addition, the study will encompass adequate coverage of the issues through the use of a comprehensive literature and background search, as well as drawing from the experience of the UVaMC staff.

Discussion

Financial Accounting

This section will discuss a cost allocation model for the Surgery Services. With the guidance of Jim McGowan, I developed a model to better allocate costs to service lines under Surgery. This model distributed expenses associated with medical supplies, operational and capital costs. The goal of this model was to allocate cost in a better manner than the traditional across-the-board method.

With health care costs climbing out of control it is important to know what is generating the expenses so that they may be better contained. By having this knowledge, necessary business decisions can be made with accuracy; the more detailed the knowledge the more accurate the decision. With traditional cost accounting, expenses that can be easily attributed to a specific service line typically were. The remaining costs were then allocated, for the most part, in an across-the-board fashion (e.g., equipment depreciation, supplies, etc.). This type of cost accounting was adequate in the past. However, with the pressure to bring health care expenditures in check, and for

health care organizations to operate more efficiently, it is now imperative to accurately know what costs are associated with a particular service.

Many health care organizations are finding themselves in the red. With this dilemma, health care organization leaders are looking for ways to cut costs in an effort to move their operating finances back in to the black. "Increasing health care costs are weighing heavily on the University of Virginia Health System's finances and will force the hospital to reduce costs considerably to remain fiscally healthy, officials said Saturday." (Sanminiatielli, 1999) To decrease expenses appropriately, rather than the traditional "salami-slice" budget cuts, leaders must know what their organization does well and not so well. By having this detailed information, a more accurate strategic plan can be laid out based on targets. Service lines that do not meet the established targets can be dealt with appropriately, either by initiating an attempt to bring them in line with the targets or possibly consider their elimination. Obviously costs are not the only factor that will be looked at when making changes (e.g., politics, community, etc.), however, it should be a major input to the equation.

The allocation of the costs were distributed based on OR utilization time, equipment depreciation for specific services, and detailed medical supply costs that were tracked to specific services. In developing this model, data was retrieved from several sources. These were the Depreciation Report, Monthly OR Service Base Supply Cost Report, OR Cases and Minutes Report,

and the UVaMC Direct and Indirect Expenses Report. The results of the model are in table 4.

Table 4: Surgical Operating Room Services Cost Allocations

Surgery Services	Total Direct	Total Indirect	Total	Direct Cost/Min	Indirect Cost/Min	Total Cost/Min
Service 1	\$72,276	\$50,844	\$123,120	\$6.47	\$4.55	\$11.01
Service 2	\$722,683	\$508,381	\$1,231,064	\$9.78	\$6.88	\$16.66
Service 3	\$3,557,150	\$2,502,321	\$6,059,471	\$10.04	\$7.06	\$17.10
Service 4	\$1,181,812	\$831,360	\$2,013,173	\$7.66	\$5.39	\$13.06
Service 5	\$1,704,726	\$1,199,211	\$2,903,937	\$10.27	\$7.23	\$17.50
Service 6	\$4,401,099	\$3,096,008	\$7,497,107	\$14.04	\$9.88	\$23.92
Service 7	\$526,614	\$370,453	\$897,068	\$10.84	\$7.63	\$18.47
Service 8	\$1,213,125	\$853,388	\$2,066,512	\$8.63	\$6.07	\$14.70
Service 9	\$634,810	\$446,565	\$1,081,374	\$7.90	\$5.56	\$13.46
Service 10	\$4,428,843	\$3,115,524	\$7,544,367	\$8.55	\$6.02	\$14.57
Service 11	\$4,485,801	\$3,155,592	\$7,641,394	\$10.09	\$7.10	\$17.18
Service 12	\$1,255,485	\$883,186	\$2,138,671	\$9.04	\$6.36	\$15.39
Total	\$24,184,424	\$17,012,833	\$41,197,257	\$9.90	\$6.96	\$16.86

In the past, the costs from the above reports were allocated evenly across the 12 services. Thus, a service that used more OR time or more expensive equipment had an operational efficiency that looked better on paper than it actually was, and vice versa.

The results of the analysis show that the model provides a detailed distribution of expenses to more accurately reflect the true costs of each service. In the past, an across-the-board cost of \$16.86 per minute would be allocated to each service. However, as can be seen from table 4, there is a wide variance in cost per minute among the services when expenses are more accurately distributed. For example, service 6's costs are more than double that of service 1's.

The wide variance between the traditional method and the

more detailed allocation shows that some services are clearly being attributed excess costs while other services are receiving much less than appropriate. For example, the two extremes are service 1 and 6 (\$11.01 and \$23.92), respectively, which vary from the across-the-board figure (\$16.86) by 34.7% and 41.9%, respectively. Say, for instance, that these services are truly break-even. Then using the traditional method would give service 1 the appearance of having a profit margin of negative 34.7% and service line 6 a profit margin of 41.9%. The across-the-board methodology paints a bleak picture of service 1 and a highly favorable picture of service 6. If an organization were to make a decision of which service to scale back or cut, service 1 would obviously be unfairly put on the chopping block first.

By using more detailed cost accounting information, organizations can make better decisions. This will help the organization to operate more efficiently by trimming areas that are less profitable. In addition, the organization will also understand what is required to support a particular service. The effect will be better use of resources and thus bringing about a better return on investment. The end result should be higher profit margins, enabling the organization to remain competitive and survive through the turmoil of the current health care environment. Finally, as insurance companies negotiate their reimbursement rates for services, an organization will know better what price is acceptable and when it is time to walk away from the table.

Decentralization and Centralization Analysis

The purpose of this section is to look at two methods of management organization, decentralized and centralized. As mentioned earlier, the emphasis of the service center approach is to place needed resources as close to the point of health care delivery as possible. A truly stand alone service center concept lends itself to a structure that is based on decentralization. This concept appears to be effective and efficient in theory, however, from a practical analysis, there are several drawbacks that will be discussed.

Decentralization

There are several undesirable features to decentralization that have come to light over the last several years at UVaMC. Interviews with leaders throughout the organization have made reference to this issue. The problems are related to both efficiencies and organizational cohesiveness. In particular, decentralization requires resources to be placed in each service center to support all needed contingencies. The decentralization structure is set up in a way that each service is independent. Such a configuration requires that resources needed to provide the particular service be dedicated to that service. Inefficiencies result when these requirements are not fully utilized. For example, if a service requires .3 FTE for respiratory care, a full FTE must be assigned to meet that requirement. The inefficient use of resources is inherent with decentralization. In contrast, a centralized structure allows peak workloads to be augmented with staff from a central labor

pool.

Furthermore, having various disciplines (e.g., respiratory care, occupational therapy, physical therapy, etc.) assigned via service centers in a decentralized approach eliminates the cohesive structure of the professional group. For example, in a centralized structure, staff report to and are evaluated by peers in the same discipline. In a decentralized approach the various disciplines report to managers that are not typically experts in their fields. Problems result from issues such as lack of career guidance, mentorship and unfair distribution of continuing education (CME).

In my analysis of the decentralized approach, I focused on Respiratory Care. Respiratory Care is one of the largest staffed disciplines at UVaMC. A study of this area was prompted by the assumed gains that could be realized by reducing FTEs.

I used benchmarking to compare UVaMC's resources in Respiratory Care to that of other institutions organized around departments. Benchmarking is becoming an established method for organizations to compare their operational efficiency with other similar organizations. "To remain competitive in this tough environment, hospitals need to closely examine - and consider adopting - the best practices of consistent top performers."

(HCIA, 1999) "Administrators seek best practices to improve the efficiency of an organization's various functions, including scheduling, medical group practice management, and home health staffing patterns." (Kibbe, Smith, LaVallee, Bailey and Bard) (1997) The data used to accomplish the benchmark comparisons

were derived from three different sources; two different benchmarking systems (HBSI and MECON) and a survey generated via e-mail among University HealthSystem Consortium (UHC) members.

The HBSI benchmarking system was recently implemented at the UVa Medical Center. This system has been in place for approximately one year and was selected because of the recommendation based on a UHC analysis. This system is replacing MECON, the previous benchmarking system used by UVaMC. The e-mail survey of several UHC members was conducted to give real time data and to verify and validate the data reported in the benchmarking systems.

The data used can be seen in tables 5 and 6. The results show that the respiratory care FTE efficiency at UVaMC is less than ideal. UVaMC currently has approximately 94 FTE's. This is above average for the majority of the comparison facilities. The analysis will show this in more detail below.

The data obtained from the UHC e-mail survey was paired down from the original twelve respondents to six organizations, including UVaMC. This was done because of the additional information available on these organizations in the HBSI system (e.g., patient days and adjusted discharges). By using the UHC e-mail survey and HBSI data, I was able to validate the data and ensure a parallel comparison. One of the six organizations was eliminated because the data reported via UHC e-mail was not consistent with the data in HBSI.

Table 5: Data from the UHC E-mail Survey

Sites	Beds in Use	Total Patient Discharge excluding New Borns	Respiratory Care FTE's
Site 1	474	18,540	97
Site 2	331	12,424	46
Site 3	396	17,109	70
Site 4	478	21,112	67
Site 5	678	28,809	80
Site 6	644	26,653	40
Site 7	567	29,196	94
Site 8	1020	No Data	82
Site 9	600	No Data	77
Site 10	600	No Data	66
Site 11	350	No Data	57
Site 12	350	No Data	54

Table 6: MECON Data

Total Patient Discharge excluding New Borns	Respiratory Care FTE's
33,761	137
32,679	102
23,980	92
27,056	89
26,451	68
27,623	64
28,746	61
25,780	61
30,759	54
25,154	47
23,831	32

The five facilities selected for the analysis were West Virginia Medical Center, University of Utah Medical Center, University of Wisconsin Medical Center, University of North Carolina Medical Center, and University of Virginia Medical Center. For the purpose of this model, the facility with the most efficient use of Respiratory Care personnel was selected as the "gold standard". This was site four, with an adjusted discharge per FTE of 489.9.

Adjusted discharges were used because it reflects only the workload associated with acute care. It eliminates discharges associated with infants, rehabilitation, and psychiatric stays. By eliminating non-acute care discharges, a reliable workload figure is obtained that is consistent across institutions. Adjusted discharges is a typical unit used in benchmarking as it facilitates an "apples to apples" comparison among organizations.

The results of this analysis indicates that UVaMC's FTE level is approximately 15% above the benchmark. This finding lends itself to further analysis to determine what number of FTEs UVaMC should have based on its number of adjusted discharges.

RC FTE Projection Model

A model was developed to project the number of FTEs a facility should have based on the established benchmark. Adjusted discharges were used for calculating the projected FTEs. This model was developed using adjusted discharges from the HBSI system and the FTE numbers from the UHC e-mail survey.

The FTE projection coefficient was generated from the benchmark hospital's (Site 4) data and used to calculate the number of FTEs each of the other four facilities should have based on their adjusted discharge numbers. The coefficient was calculated by taking the number of adjusted discharges for Site 4 and dividing it by Site 4's number of FTEs. The result was 489.9. The coefficient, adjusted discharges and FTEs can be seen in table 7.

Using the model, the projected number of FTEs for UVaMC is 83.87. This number was calculated by multiplying the FTE projection coefficient by the number of UVaMC adjusted discharges. To validate this model, the Site 3 data was used. Based on the HBSI system's data, Site 3's Respiratory Care resource efficiency is very close to Site 4's. With the projection model, Site 3's projected FTEs were within 1.5% from their actual FTE numbers. Additionally, Jim McGowan is familiar with Site 3's Respiratory Care program and is confident with the projected FTE number. The projection graph can be seen in figure 4.

Based on the 1.5% difference, I believe that an error tolerance of plus or minus 3% is conservative⁹. Using this tolerance, the projected range for Respiratory Care FTEs at UVaMC is between 86.39 and 81.35. This projection estimates a potential FTE reduction of between 7.76 to 12.8. The finding indicates that a centralized approach with Respiratory Care has the potential of being more efficient (i.e., better assigning FTE's based on workload).

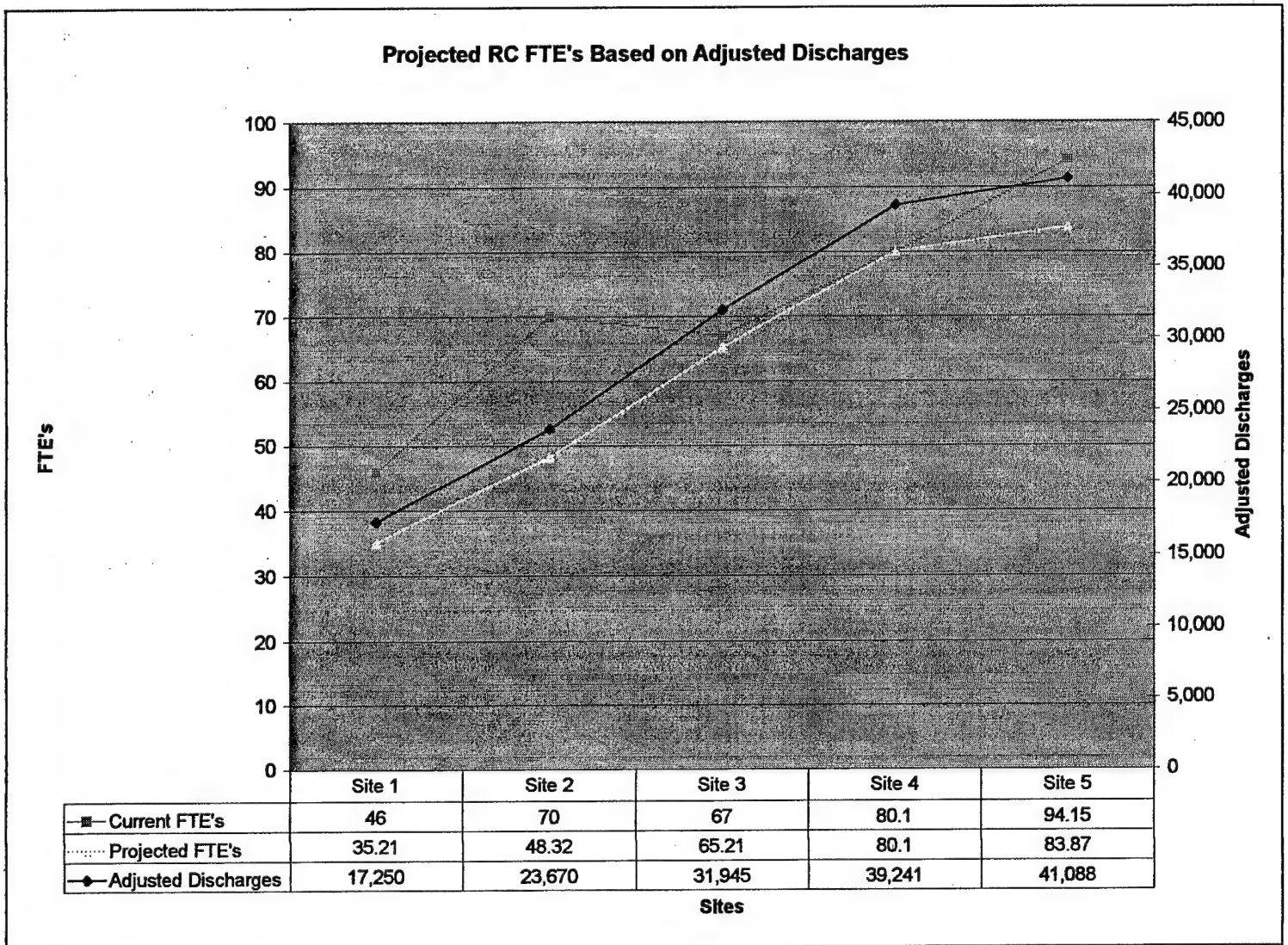
Table 7: Benchmark Data from Five University Hospitals

Sites	Current Respiratory Care FTE's	Beds in Use	Patient Bed Days excluding New Borns	Adjusted Discharges	Adjusted Discharges/ FTE
Site 1	46	331	83,295	17,250	375.0
Site 2	70	396	105,984	23,670	338.1
Site 3	67	478	125,121	31,945	476.8
Site 4	80	678	177,491	39,241	489.9
Site 5	94	567	166,461	41,088	437.1

Note: Data obtained from UHC e-mail and HBSI Benchmarking system

From the analysis there is potential of reducing costs by adjusting the UVaMC Respiratory Care FTEs to the projected figure from the model above. With an estimated average annual salary plus benefits of \$44,716 per FTE¹⁰. The potential cost avoidance ranges between \$346,996 and \$572,365 annually.

In conclusion, this finding provides evidence that similar organizations which operate in a department approach have a more efficient use of Respiratory Care resources. Based on this finding and interviews with UVaMC managers, some service centers have a higher number of Respiratory Care FTEs due to the inherent nature of decentralization. That is, flexibility to adjust staff based on workload fluctuations is not conducive in a decentralized approach. As a result, there are possible gains in resource efficiencies if a balance between centralization and decentralization can be obtained.

Figure 4: Projected Respiratory Care FTEs

Centralization

The centralization approach lends itself to the departmental organization structure. Here, all similar resources are controlled by a department. The resources are allocated as needed, however this is often not on a consistent basis. Furthermore, this management structure provides less control at the point of health care delivery due to the

"stovepipe" nature of the department structure. Murphy (1995) notes that faster processes and responses for patients and employees are achieved by moving the services closer to the patient. This is not an advantage of the centralized method. Deriving a balance between these two types of management structures in a hybrid approach is believed to provide the best of both worlds while minimizing the less desirable features.

There were several functions within UVaMC that remained centralized. These include Medical Material, Clinical Engineering, and the Transportation Department. One area in particular, the Transportation Department, has had problems in supporting the infrastructure. Here there were various complaints in regard to delays in transporting patients, equipment, specimens and stat pharmaceuticals. The most distressing of these complaints were those involving patients. Numerous complaints were sent to the administration by both patients and staff with regard to the time taken to respond to transportation requests. My study of the centralization focuses on the Transportation Department.

In assessing the underlying causes of the recurring problems, the predominate issue was the lack of control of the process. One department was responsible for overseeing the transportation of patients, equipment, stat pharmaceuticals, etc. throughout the entire medical center. By the nature of the centralized approach, the majority of the transportation staff were not assigned to specific areas. This did not lend itself to a sense of ownership or belonging to a team. Furthermore,

there was no method to track or monitor the various transportation requirements in place.

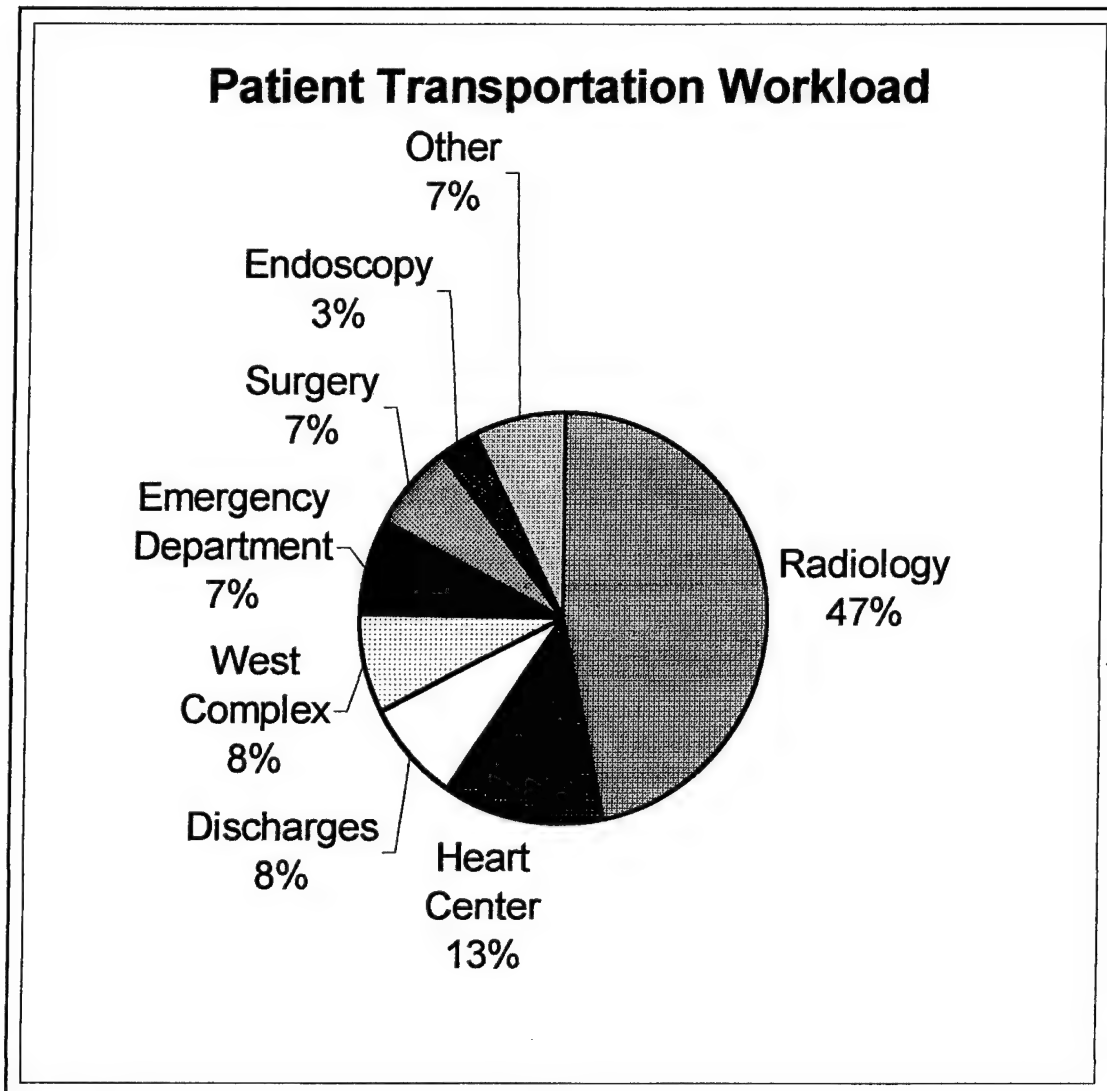
With this premise, the UVaMC leadership believed that the Transportation Department would be more effective and efficient if the staff were dedicated to areas of high use, a "virtual decentralization" if you will. This was based on input from the staff and on the experience from several pilots which dedicated staff in small numbers to specific areas such as Radiology and Surgery.

Based on results of a data analysis of the patient transportation workload, patient transportation staff are being assigned to specific areas. The majority of this dispersion of staff is to the Radiology and Heart Center areas. The graph of the workload requirements can be seen in figure 5. By virtually decentralizing the staff, management believes that the staff members will develop a sense of membership within the location they are working.

Additionally, by working in the same area on a daily basis, an individual will become familiar with the location and operations of that area. This familiarity should increase the efficiency and effectiveness of the Transportation Department's responsibilities. Murphy, 1995 states, "While each partner group applies its expertise and professional or technical skills, each knows elements of other partner roles that can be provided safely and with quality to benefit patients and team." Waters and Young (1997) state, "Teamwork and togetherness were identified as cornerstone values...". Furthermore, the local

areas will have day to day oversight of the transportation staff and will be able to utilize the staff in the best way for that area (i.e., control of their support resources). This will more than likely increase patient and staff satisfaction.

Figure 5: Patient Transportation Workload Graph



Note: Based on 14 consecutive days of data from August 1998

I interviewed a supervisor of an area with dedicated transportation staff and a transportation employee. From their experience they both agreed "virtual decentralization" was the better approach. In particular, throughout the day the supervisor knew where the transporters were and was able to assign them as needed based on workload requirements. In cases of peak workload, augmentation was provided by additional support from the Transportation Department. This allows for a streamlined system, giving the area the needed support for typical daily operations with the option of additional support through a resource pool for peak workloads.

The transportation staff member was in favor of working in a specific location on a consistent basis. He said that this allows the staff member to become familiar with their duties, and thus he knows what to expect. This approach also allows the staff member to become part of that local team, which provides a sense of ownership and team building. This psychosocial element promotes a positive work environment. "An interdisciplinary, collaborative team attitude permeates the organization and energizes the work in all spheres." (Weitekamp, Thorndyke, McCollister, 1996)

Findings

In looking at the decentralization and centralization structures, evidence from several analyses provide support for the premise that neither centralization nor decentralization is the best method; rather a hybrid approach of the two can capture the positive elements of both systems and mitigate the

negatives. For example, pros to the decentralized approach are: Control is put as close to the point of health care delivery as possible and a sense of ownership and belonging to the team are achieved. The pro of centralization is the economy of scale that allows flexibility, camaraderie and peer review. By centralizing hiring, training, etc. these areas of responsibility can be accomplished more effectively and efficiently. Furthermore, staff can still retain a sense of belonging to their area of discipline; getting adequate CME, having a point of contact for guidance and mentorship, etc.

From the experience of both organizational structures, UVaMC and UHC believe that a mixture of both centralization and decentralization is the more appropriate method. This concept pushes the staff out to the area of health care delivery as much as possible, yet keeps responsibilities that would be more effective under an economies of scale in a centralized structure. Ancillary disciplines such as Respiratory Care, Physical Therapy, etc. would hire, train, and oversee CME in a centralized manner. However, the staff would be predominately dedicated to specific areas where they would report on a daily basis. The exception is where the workload does not require a full FTE. This requirement would be supported in a centralized fashion. For example, if an area requires 4.6 FTEs, 4 FTEs would be dedicated to the area and the .6 FTE would be supported by a resource pool, which is managed centrally.

The UVaMC Re-design

After five years of delivering health care in a predominately decentralized approach, UVaMC is revisiting the service center concept and looking to make changes that will continue to provide high quality health care, yet in a more efficient manner. Jim McGowan has been tasked to lead this re-design effort.

The concept that UVaMC is moving towards is a hybrid approach between decentralization and centralization for some of the ancillary services. This approach will establish, as Jim McGowan puts it, "virtual centralized" departments for ancillary disciplines such as Respiratory Care. The purpose of this initiative is to structure core responsibilities in a more efficient manner while still maintaining the benefits of the decentralized approach by dedicating staff where needed.

The UHC conducted a study in 1997 of service center models and made recommendations of what worked best. For ancillary services, they recommended that they stay centralized, however the functions should report directly to the service administrators. Also, staff should be dedicated to the services wherever possible (i.e., high-use service lines). Additionally, contracts should be used to delineate the expected service and that these contracts be reviewed periodically to ensure that the performance standards are being met. (University HealthSystem Consortium, 1997)

Implementation

The implementation of the UVaMC re-design was started in February, 1999. The driver for this re-design was the increasing costs of health care and a declining increase in revenues. As with other health care organizations, UVaMC is experiencing the effect of this with decreasing profit margins. Re-design at UVaMC would be the first step to cutting costs by restructuring the organization, making it more efficient wherever possible.

The re-design is currently ongoing. Jim McGowan's emphasis in bringing about this change has been to thoroughly communicate with the medical center staff. Change in an organization is difficult, with the staff going through anxiety and fears of how it will effect their world. The best way to ease these fears and anxiety is through two-way communication. Mailkot states, "Without effective communication, an organization cannot build a trusting relationship with employees...Communication must flow upwards and downwards...Ineffective communication leads to wrong impressions, missed deadlines, incorrect assumptions, rumors and costly fixes." As Jim McGowan puts it, "Leaders must listen, listen, and listen some more."

The biggest issues staff bring up from the re-design are "Who will I report to", "Who writes my evaluation", and "Will I be relocated in another area now that I am comfortable working in the location I am currently in". Jim McGowan's approach is to ease into the re-design so that the correct changes are made in a methodical manner that minimizes the disruptions to the

organization, staff, and patients.

The re-design will be interesting to watch over the next several months. In addition, it will provide an excellent opportunity to observe first hand how change is accomplished in an organization.

Patient Satisfaction Analysis

As mentioned earlier, enhanced quality and patient satisfaction was the primary purpose of implementing the service center approach at UVaMC. This section analyzes patient satisfaction at UVaMC, looking at the overall patient satisfaction for the medical center and detailed patient satisfaction levels specific to the Surgical Service. The analysis will review quarterly data over a five year period. The data captured begins with the implementation of the service center model. There was no patient satisfaction data available prior to the implementation of the service center model, so a direct comparison between the two organizational structures was not possible.

The first step in the analysis was to discern major changes in the patient satisfaction results. This was accomplished with the use of control charts. Upper and lower control limits were set based on the formula in the book Continuous Quality Improvement in Health Care¹¹. Here, trends were observed and selected based on their consistency across all of the indicators.

The analysis indicates that one goal of the service center model, enhancing patient satisfaction, is not being met. Both

the overall and the majority of the Surgical Service patient satisfaction levels have been declining over the last five years. Overall patient satisfaction with Nurses, Physicians, Nursing time spent with patients, and hospital stays have declined the most. Other declines are related to environment and staff time spent with the patients.

An important finding was related to decreased staff time spent with the patient. This finding is consistent with the current health care environment. With managed care driving down reimbursement rates, organizations are forced to cut costs to respond to declining revenues. This introduces the "do more with less" philosophy where staff must streamline their interaction with the patient.

With declining resources resulting in efforts to reduce costs, a conclusion can be drawn with the satisfaction levels that have been decreasing. Table 8 shows the declining levels that are related to the time spent with the patient, whether it be overall interaction with the patient, explaining what the staff is doing, conversational time, or educating the patient on how to take care of themselves once they leave. It appears that the decline can be attributed to the current situation in health care more than the service center model. For example, Tenet Health Care spokesman Harry Anderson indicated that they will lay off 200 employees throughout Philadelphia hospitals in order to bring costs in line with

declining revenues. These cuts cover a range of professions to include housekeeping, nursing, management and dietary services. (Hensley, 1999)

Table 8: Patient Satisfaction Trends

Survey Question	Change over five year period
Overall satisfaction with MDs	-5.85%
Overall satisfaction with stay	-4.53%
RNs spent enough time with me	-3.59%
Overall satisfaction with RNs	-3.58%
My room was quiet	-2.20%
Nurses introduced themselves	-1.86%
RNs explained what they were doing	-0.94%
My room was clean	-0.70%
Understood how to take care of myself at home	-0.46%
Knew who to call for help if signs occurred	-0.11%
Someone met me when I got to my room	5.67%
RNs responded to my needs quickly	0.98%
Health care team communicated well with each other	0.60%

The analysis further indicates that managed care may be influencing the perception of quality based from the patients perspective. Organizations have multiple concerns to include financial and regulatory considerations which tend to degrade the overall commitment of patient care, therefore, the service rendered becomes more depersonalized. (Niles, et al., 1996)

The study shows that patients perceive that the nursing staff is not spending adequate time with them. This perception can be expected with the push to treat more patients with less resources and as a result staff members must spend less time with each patient. Additionally, the added stress to "do more with less" inherently will affect interpersonal relationships because reducing time with the patient makes interpersonal

activities such as introducing themselves and taking the time to explain what they are doing a low priority.

Furthermore, major events which occurred within the organization seem to be correlated with patient satisfaction. Several organizational events appear to affect patient satisfaction due to the effect these changes had on the employee satisfaction. Reisdorfer (1996) points out that there is a direct correlation between patient satisfaction and employee satisfaction. There were two major drops in patient satisfaction across all survey questions analyzed. These two events correlated with two significant events within the organization. The first major drop started with the April-June 1995 quarter. This coincided with a budgeting event that occurred in which there was a discussion of downsizing from between 200 to 300 positions. The organization never took this drastic measure, which is believed to be the reason for the marked rebound in the October-December 1995 period.

The second major decline occurred during the April 1996 - March 1997 time frame. At the beginning of this decline, one of the well respected leaders at UVaMC was expected to leave and did in June 1996. This individual was the Chief Nursing Officer and was nationally recognized. There were significant changes implemented during her time at UVaMC focusing on the nursing staff. For example, she implemented a promotion track for clinical nurses. Before, if a nurse wanted to be promoted after a certain level he/she would have to move into an administrative/management roll. Additionally, an employee

satisfaction survey was conducted to determine the staff needs. Once she left, this program was dropped.

Although the majority of patient satisfaction levels have decreased, there are several that have increased. The areas that increased over the years were related to communication between health team members, coordination, and efficiency. Note, these are also goals of the service center concept.

An indicator which relates to efficiency is better coordination with the health care teams. The patients perceive that the communication with health care team members is better. Furthermore, the units were ready for the patient when they arrived and the patients needs were responded to quickly.

From the data analysis, the core goals of the service center approach appear to have been met, however, underlying factors have kept the overall desire from being achieved. It appears that better coordination and communication is taking place with service center teams. Events outside the control of the service center approach appear to be adversely affecting patient satisfaction. These mainly center around the available time staff has to spend with the patient. Even though the overall patient satisfaction continues to decline, I would conclude that this decline is lessened by the service center model. If there were not the improvements in coordination and communication, the effects would be a greater decline on patient satisfaction and more than likely quality.

Conclusion

The service center model is becoming a more adapted strategy in the health care sector. This is mostly due to its success in other industries and success seen by health care organizations who were willing to be early adapters of the model. UVaMC was recently selected as the HCIA top 100 Hospitals to benchmark. Although UVaMC is seeing declining increases in revenues and increasing costs, they are fairing much better than many other academic health care institutions (e.g., University of Georgetown Medical Center, Medical College of Virginia, University of California-San Francisco Medical Center, etc.). While many other university medical centers are operating in the red, UVaMC is managing to stay in the black. All-be-it with declining profit margins, it is still a positive profit margin none the less.

Even with the success realized thus far, UVaMC continues to refine the service center organizational structure, attempting to make operations more efficient, and ultimately enhancing quality while reducing costs. Change initiatives include developing the proper balance between centralized and decentralized operations and reducing the number of service lines. Both of these initiatives are supported by the 1997 study conducted by UHC.

The service center model, as it applies to the health care industry, is still in its infancy, yet it is learning to crawl. As with other industries, I believe this approach will bring the needed efficiencies to the health care industry to

help curb escalating costs. As more health care organizations come on board, more ideas will be developed of how to maximize the benefits of this structure. I am pleased to say that the service center approach is a viable choice in answering the ever-increasing challenges in the new era of health care. I believe that this concept will take health care delivery to higher levels in the new millenium. I feel very fortunate to have had the opportunity to view the operation of the service center model, the future of health care delivery, first hand.

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Footnotes

¹ A dramatic illustration is the automobile industry where health care benefits for autoworkers increased to approximately \$600 per automobile, which amounts to as much as seven percent of the sticker price (Iacocca and Novak, 1984).

² Health insurance basically started in 1929 when Baylor Hospital in Texas offered 1,500 teachers prepaid health care coverage (Kongstvedt, 1996).

³ In 1910, Western Clinic in Tacoma, Washington started what was considered to be the first Health Maintenance Organization (HMO) with a \$.50 per member per month fee (Kongsveldt, 1996). Initiatives such as this were few until the 1970's. A primer for generating greater interest in managing care was the HMO Act of 1973. Through this act, incentives were provided such as start-up funding and access to employer-based insurance. As expected, this move was met with resistance from physicians. Physicians thought this to be the practice of "cooperate medicine" and interfered with their autonomy to treat the patient. However, as more health plans moved in this direction, physicians felt pressured to succumb to the movement or be left out all together.

⁴ The product line approach is a management structure that is a decentralized multi-disciplinarily method to providing a product or service. It is a change from a centralized based structure where tasks are accomplished by specialists that then send to the next group of specialists to perform their task in

completing the product or service. The Product-line approach empowers control to those who are directly involved with the process. (Lanza, et al., 1997)

⁵ "Focused factories" is a concept that came about in the early 1970's. Wickham Skinner published an article on this method in the 1974 issue of the Harvard Business Review. Skinner states that one of the solutions to solving the productivity dilemma is, "Learning to structure basic manufacturing policies and supporting services so that they focus on one explicit manufacturing objective instead of many inconsistent, conflicting, implicit objectives." He argued that complex and overly ambitious factories were at the heart of the country's productivity crisis. The advantages mentioned with this approach is the ability to provide higher quality health care at lower costs. Herzlinger states that, "The ease of evaluating the price and quality of care provided by focused factories will cause ferocious competition to break out among [health care organizations]." (Herzlinger, 1998)

⁶ The analysis was conducted by two health care management and consulting firms, HCIA and William M. Mercer, Incorporated. HCIA is a Baltimore-based health care information company and Mercer is a New York-based human resources management consulting firm. This annual benchmark study started in 1993 and has been evolving since then. The study analyzes areas of clinical, operational and financial performance. The data was obtained from the 1997 Medicare cost and discharge data from 3,258 acute

care hospitals. (Morrissey, 1998)

⁷ Industries have been using this approach for several decades. The automobile industry moved to this concept when fierce competition moved in from Japan in the 1970's. It was its only way to survive. "Successful automobile executives learned to pay attention to the customer. Automobile dealers who paid attention to customers' complaints about their sales process found that busy, well-informed Americans did not enjoy haggling over prices." (Herzlinger, 1998)

⁸ Jim McGowan has extensive experience in health care. He has been Director of Respiratory Therapy and Respiratory Care at three separate institutions over the past 20 years. He is currently the Service Center Administrator for Surgical Services at UVaMC. Jim McGowan has various degrees from 5 academic institutions. His most recent is an MBA from Strayer University, Washington D.C. (1994). Currently, he is pursuing an Executive Doctoral degree in Healthcare Administration through the Medical University of South Carolina, Charleston, South Carolina.

⁹ Jim McGowan felt that this range should be more than adequate based on his experience in respiratory care and knowledge of site 3 and their respiratory care FTE requirements.

¹⁰ The average salary was calculated based on the average pay range for each Respiratory Care role. The percentage of personnel in each role was calculated and the average salary for that role was applied and totaled based on the percentage of

personnel in each role. The roles were Respiratory Therapist Supervisor, Respiratory Therapist, and Respiratory Technician. The average salary was calculated to be \$36,354. After the total estimated salary was calculated, a benefits cost of 23% of the average salary was applied. This brought the total average cost of a Respiratory Care FTE to be \$44,716. Jim McGowan felt that this was a good approximation for the average payment for a Respiratory Care FTE.

¹¹ The standard deviation was taken and divided by the sample size to give the standard error of the mean. This was then multiplied by three to give the upper and lower limits.